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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,755	04/09/2004	Kevin D. Belfield	UCF-385	3191

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EXAMINER	
ANGEBRANNDT, MARTIN J	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
01/21/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/821,755	BELFIELD, KEVIN D.	
	Examiner	Art Unit	
	Martin J. Angebranndt	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 October 2008 and 14 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,8,10-14 and 18-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,8,10-14 and 18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The response of the applicant has been read and given careful consideration. Responses to the arguments are presented after the first rejections to which they are directed. The proper terminal disclaimers filed obviate the rejection based upon copending Application No. 11/707553, copending Application No. 11/256552, copending Application No. 11/272189 and U.S. Patent No. 7,001,708. Rejections of the previous office action, not repeated below are withdrawn in view of the amendments to the claims.

2. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

This limitation is already present in claim 4.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-4,6,10 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Devoe et al. WO 01/96952, in view of Sysak '860, Iwakura et al. '682, Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996) and Davis '071.

Devoe et al. WO 01/96952 teaches two photon imaging as means for controlling the area of exposure (within focal volume) in three dimensions and the ability to write features below the diffraction limit. The use of a ti:sapphire laser is disclosed. (8/17+). The use of sensitizers to sensitize iodonum and sulfoniumsalts is disclosed. (21/3-16). The use of dye precursor, such as lueco quinine, thiazine, phenazine or triarylmethane dyes is disclosed. (29/11-25). The use of binders including polystyrene and PMMA is disclosed. (40/19+) Examples 2, teaches a mixture of solution A which contains a diaryl iodonium salt, a leuco dye and a two photon sensitizer with solution C which contains a polymeric binder (cellulose acetate butyrate) which is coated to a thickness of 5 microns in thickness. This is exposed using the Ti:sapphire laser operating at 800 nm which scanning facilitated using the three axis stage and imaging of the layer (AC) to form cyan colored images is disclosed (examples 5 and 6). The use of fluorene sensitizers is disclosed on page 20. the Ti:sapphire laser is tunable over 700-980 nm. (8/22-24). The fluorescence of the photosensitizers is disclosed page 10+. (Devoe et al. WO 01/96952 is accorded the date of 06/14/2001 as a 102 reference as the priority document 60/211708 does not disclose the cited example. The approximately is held to embrace two or three layers.)

Sysak '860 teaches the formation of multiple steps (with different densities) in leuco dye images (see tables). The use of lasers in the imaging process is disclosed (9/8-15). Useful binders include PMMA and polystyrene. (4/46-57). Useful classes of leuco dyes are disclosed (col 3-4).

Iwakura et al. '682 teaches various leuco dyes including triphenylmethane, phenothiazine, spiropyran and fluorene compounds. (9/17-34). Useful binders include PMMA

and polystyrene (12/11-21). The use of iodonium or sulfonium compounds is disclosed (15/65-66).

Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996) teaches confocal imaging with detection of the full (multicolor) fluorescent spectrum (page 173/right column).

Davis '071 teaches the colored fluorene dye exhibits fluorescence (4/35+)

It would have been obvious to one skilled in the art to modify example 2 of Devoe et al. WO 01/96952, by using polystyrene or PMMA based upon the disclosure at (40/19+) of Devoe et al. WO 01/96952, replacing the phenoxazine dye with a fluorene dye such as those disclosed by Iwakura et al. '682 based upon the disclosure of equivalence and to use this to form recorded regions of varying density correlated to the exposure (actually the square as this is two photon process) with a reasonable expectation multivalued tonal images based upon the teachings that this is old and well known for leuco dye images by Sysak '860 and using a scanning confocal microscope such as the MRC600 or MRC500 disclosed by Devoe et al. WO 01/96952 or Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996) with the multiwavelength detection by Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996) to collect full spectrum data from the imaged areas with a reasonable expectation of capturing a fluorescent image based upon Davis '071 teaching that colored fluorene dyes exhibits fluorescence and the teachings of the fluorescence of the photosensitizers by Devoe et al. WO 01/96952.

The applicant has asserted that the examiner has used impermissible hindsight to "find every element of the applicant's invention" . As these were within the single reference, the

argument is misplaced. The language “for optical data storage on a compact disc (CD) or digital video disc (DVD) is considered an intended use until the applicant inserts that structure into the body of the claim, rather than merely into the preamble. The examiner suggests before "data storage medium" inserting - -a CD or DVD - - in claim 1 and making similar amendment in the other independent claims. This would obviate the rejection at hand. There is sufficient information in the references for one skilled in the art to predict the outcome, noting in particular the disclosures of equivalence for the leuco dyes and the old and well known use of multilevel (multistep) recording with leuco dyes in forming images.

4. Claims 1-4,6,10 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Devoe et al. WO 01/96952, in view of Sysak ‘860, Iwakura et al. ‘682, Bhawalkar et al. “Two photon laser scanning fluorescence microscopy ..”, Bioimaging vol. 4 pp. 168-178 (1996) and Davis ‘071, further in view of Marder et al. ‘913.

Marder et al. ‘913 teaches the use of binders in two photon absorbing compositions (28/29-53). The use of polymerization processes is also disclosed. (10/12-30)The composition in column 99 include a binder (see also 98/65-99/11). The use of these compositions in writing three dimensional media is taught in column 100. The two photoabsorption maxima for bis{4-diphenylamino)styryl] 1,4-dimethoxybenzene is 733 nm.

It would have been obvious to modify the processes and media rendered obvious by the conbination of over Devoe et al. WO 01/96952, in view of Sysak ‘860, Iwakura et al. ‘682, Bhawalkar et al. “Two photon laser scanning fluorescence microscopy ..”, Bioimaging vol. 4 pp. 168-178 (1996) and Davis ‘071 by using other laser wavelengths such as 733 nm, in place of the 800 nm used in the invention with a reasonable expectation of forming the desired images with

an increased sensitivity based upon the two photoabsorption maxima for bis{4-diphenylamino)styryl] 1,4-dimethoxybenzene taught by Marder et al. '913.

The examiner is relying upon Marder et al. only for the inherency of the absorption of the sensitizing dye used in example 2 of Deveoe et al., so the arguments of improper hindsight is flawed.

5. Claims 1-4,6,8,10-14 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Devoe et al. WO 01/96952, in view of Sysak '860, Iwakura et al. '682, Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996), Davis '071 and Marder et al. '913, further in view of Glushko et al. '671 and Fourkas et al. '063.

Glushko et al. '671 teach the formation of fluorescent multilayered optical recording media illustrated in figures 12-18. The formation of "100 or more" layers is specifically disclosed. (9/17-20). The use of multiple fluorescent detectors is disclosed (17/45-55).

Fourkas et al. '063 teach the variation in the power and duration to control the data bit size. [0025]. The media can be can be doped into a porous medium or coated as a multilayered form with spacers between the layers. [0043].

It would have been obvious to one skilled in the art to modify the processes or media using two or three layer embodiments rendered obvious by the combination of Devoe et al. WO 01/96952, in view of Sysak '860, Iwakura et al. '682, Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996), Davis '071 and Marder et al. '913 by adding other layers of to 100 or more with spacers based upon the teaches

of Glushko et al. '671 and Flourkas et al. as each layer will increase the information density of the medium.

The use of multilevel recording is taught in one of the other, newly applied, references and so the point that the secondary references (previously applied) fail to teach this feature is flawed.

6. Claims 1-4,6,8,10-14 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Devoe et al. WO 01/96952, in view of Sysak '860, Iwakura et al. '682, Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996), Davis '071, Marder et al. '913, Glushko et al. '671 and Fourkas et al. '063, further in view of Rentzepis et al. '031 and Tanaka et al. "Rapid sub-diffractin limit laser micro/nano processing in a threshold material system", Appl. Phys. Lett., Vol. 80(2) pp. 312-314 (01/2002).

Rentzepis et al. '031 teach 100 planes of data [0010]. The use of 3D media which are a cube (1 cm^3 or a disk 1.25 cm thick and 8 cm in diameter where plane of data 20 microns thick. [0145] 1.25 cm = 12500 microns. Which yield approximately 312 (20 micron thick) data layers with an equal thickness of material (20 microns) separating these planes.

Tanaka et al. "Rapid sub-diffraction limit laser micro/nano processing in a threshold material system", Appl. Phys. Lett., Vol. 80(2) pp. 312-314 (01/2002) teaches the formation of sub microns features (down to 120 nm) using two photon excitation processes with a Ti:sapphire operating at 780 nm and 150 fs pulsewidth. (page 312). (Note instant specification and prepub at page 10)

To further support the position that submicron features can be written and that more than 300 layers can be formed and that this would have been obvious to one skilled in the art the examiner cites Rentzepis et al. '031 which teaches the formation of planes of data with thickneses of 20 microns and media having thicknesses of 1 cm or 1.25 cm and the teachings of Tanaka et al. "Rapid sub-diffraction limit laser micro/nano processing in a threshold material system", Appl. Phys. Lett., Vol. 80(2) pp. 312-314 (01/2002) which establishes that submicron features can be made/recorded and establishes that the desired variation in bit size taught by Fourkas et al. '063 embraces the 0.576 micron (576 nm) size recited in claim 22 and holds that it would have been obvious to modify the media /processes rendered obvious by the combination of Devoe et al. WO 01/96952, in view of Sysak '860, Iwakura et al. '682, Bhawalkar et al. "Two photon laser scanning fluorescence microscopy ..", Bioimaging vol. 4 pp. 168-178 (1996), Davis '071, Marder et al. '913, Glushko et al. '671 and Fourkas et al. '063 by adding further layers and using fine laser spots based upon the teachings withinthe art by Rentzepis et al. '031 and Tanaka et al. "Rapid sub-diffractin limit laser micro/nano processing in a threshold material system", Appl. Phys. Lett., Vol. 80(2) pp. 312-314 (01/2002).

The applicant bears the burden of showing the unobvious benefit arising from this bit size.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin J Angebranndt/
Primary Examiner, Art Unit 1795

Martin J Angebranndt
Primary Examiner
Art Unit 1756

1/16/09